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PUTNAM ON THE INDETERMINACY OF REFERENCE

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In the second chapter of his *Reason, Truth and History* [3], H. Putnam discusses 'a problem about reference'. This is a very mundane counterpart of his interpretation of the Löwenheim-Skolem theorem on the existence of non-intended models of set theory [2]. The paradox he provides is striking. But, as Putnam states :'genuine paradoxes are never unimportant ; they always show something is wrong with the way we have been thinking'

[3, pp. 35 – 36]. The point is, however, to find out which of our ways of thinking come to be questioned.

I. Statement of the paradox [1] Putnam thinks that the difficulty with the received view about reference, is that it tries to fix the extensions and intensions of individual terms by fixing the truth-conditions for whole sentences [3, pp. 32 – 33]. His claim is very strong : '*no view which only fixes the truth-values for whole sentences can fix reference*, even if it specifies truth-values for sentences *in every possible world*' [3, p. 33]. Indeed, it is possible to find out two different interpretations of a language (they are different in the sense that they assign different extensions and intensions to individual terms) but which agree in the truth-conditions for every sentence in ever world. The technical proof is given in the Appendix to the book [3, pp. 217 – 218] and an illustration of the method is discussed at length on pages 33 – 38. It is the *cat-on-mat paradox*. Consider the sentence : (1) A cat is on a mat. Its truth-conditions are easily stated : if in a world, say w, there is at least one cat on at least one mat, then (1) is true at w and false otherwise. But here is another problem : when one states that some cat is on some mat, he assumes that 'cat' refers to cats and 'mat' refers to mats. However, how is it possible that a term refers to exactly what we intend that it should refer to? On the standard view, the answer is this : suppose^ cat^ does not refer to cats but, say, to cherries and mat does not refer to mats, but to trees. Then sentence (1) is true in every world where at least one cherry is at least on one tree. Now we do not assume any necessary connexion between the fact that some cat is on some mat and the fact that some cherry is on some tree ; therefore, e.g., there is some world so that the former is the case while the latter is not the case. But if this obtains, then one cannot interpret 'cat' to refer to cherries and 'mat' to refer to trees, for in at least one word the two interpretations provide different truth-values for sentence (1). Indeed, if 'cat' meant cherry and 'mat' meant tree, then the truth-conditions for (1) in at least one world would be different. This view on referring, Putnam argues, does not hold. Indeed, it is possible to find another sentence, e.g., (2) A cat^ is on a mat^, so that (2) is true at exactly those worlds where (1) is true and false at exactly those worlds where (1) is false, but in the actual worlds 'cat^' refers to cherries and 'mat^' refers to trees. Or, to put it in other words, sentence (1) received a new interpretation in which 'cat' comes to mean cat^ and 'mat' comes to mean mat^.

To see that, start with the following two sentences : (3) Some cat is on some mat, and (4) Some cherry is on some tree. Then assign to each world a pair (i, j), with $i, j = 1, -1$ so that i (respectively j) is 1 if (3) (respectively (4)) is true at it and i (respectively j) is -1 if (3) (respectively (4)) is false at it. Thus, we have four worlds [2], namely : $w \leftrightarrow (1, 1)$; $w' \leftrightarrow (1, -1)$; $w'' \leftrightarrow (-1 -1)$: and $w''' \leftrightarrow (-1, 1)$. Let W [3] be their set.

The definition of the property of being a cat^ (respectively a mat^) is given by cases (I slightly modify Putnam's own definitions) :

[1] This is, Putnam's view, a paradox in the *philosophyollogic* [2].

[2] Actualy, Putnam combines cases w'' and''', but tb carry out the argument in full detail one needs w'' as well as w'''.

[3] Observe that w, w' ... are *worlds-types*, but, for the sake of simplicity, I shall argue as if they were worlds.

D1. x is a cat^ iff w holds and x is a cherry; or w' holds and x is a cat; or w'' holds and x is a cherry; or w''' holds and x is a cat.

D2. x is a mat^ iff w holds and x is a tree; or w' holds and x is a mat; or w'' holds and x is a tree; or w''' holds and x is a mat.

On these definitions, sentences (1) and (2) have exactly the same truth-values at every world in W (3, p. 34). Let me introduce some abbreviations: let $C(x)$ abbreviate: x is a cat and $C^\wedge(x)$ abbreviate: x is a cat^; further, let $M(x)$ be short for: x is a mat, $M^\wedge(x)$ for: x is a mat^; $H(x)$—for: x is a cherry, $H^\wedge(x)$—for: x is a cherry^; and $T(x)$—for: x is a te, $T^\wedge(x)$—for x is a tree^.

A genuine reaction to the above paradox is, of course, to argue that one could provide logical or epistemological reasons to the effect that the property of being a cat differentiates from the property of being a cat^. But this does not hold, Putnam claims. The most important of the arguments he takes into account is this; 'the definitions of 'cat^' and 'mat^' given above refer to things other than the object in question (cherries on trees and cats on mats[4]), and thus signify ***extrinsic*** properties of the objects that have these properties. In the actual world, every cherry is a cat^; but it would not be a cat^, even though its intrinsic properties would be exactly the same, if no cherry were on any tree[5]. In contrast, whether, or not something is a cat depends only upon its intrinsic propertiis' [3 p. 37]. However, Putnam replies, it is possible to prove that being 'intrinsic' or 'extrinsic' is a relative matter (it is relative 'to a choice of which properties one takes as ***basic***; no property is intrinsic or extrinsic in itself' [3, p. 38]). Consider indeed the sentences: (3^) Some cat^ is on some mat^; (4) Some cherry^ is on some tree^ and then construct the set $W^\wedge = \{w^\wedge, w'^\wedge, w''^\wedge, w'''^\wedge\}$ of worlds in the same manner as done above for W. Then cat and mat are definable by:

D3. $C(x)$ iff $w^\wedge$ holds and $H^\wedge(x)$; or $w'^\wedge$ holds and $C^\wedge(x)$; or $w''^\wedge$ holds and $H^\wedge(x)$; or $w'''^\wedge$ holds and $C^\wedge(x)$.

D4. $M(x)$ iff $w^\wedge$ holds and $T^\wedge(x)$; or $w'^\wedge$ holds and $M^\wedge(x)$; or $w''^\wedge$ holds and $T^\wedge(x)$; or $w'''^\wedge$ holds and $M^\wedge(x)$.

II. **Semantical hypotheses.** However, something must be wrong in this argument, for we all intend to use 'cat' so that it would refer to cats, not to cats^ and agree that this is the *correct* use of the world. One would be ready to argue that it is *incoherent* to maintain that he (or she) is referring to cats^ when he (or she) says 'cat', because in his (or her) language whatever he (or she) refers to as a 'cat' is a cat [3, p. 36 n]. Putnam argues that the cat-on-mat paradox is grounded by the hypotheses that fixing truth-values for whole sentences is a sufficient condition for fixing the extensions and intensions of individual terms. The rejection of this hypothesis is consistent, in Putnam's view, with an epistemological understanding of the notion of truth. This is turn helps him ro reject metaphysical realism and rely on the position of internalism.

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[4] The most important objects involved in the definition of cat^are not, in my view, cherries on trees or cats on mats, but *worlds*.

[5] And if (according to D_1) some cats were on some mats.

It seems to me, however, that the structure of the present argument is more sophisticated than it looks like. My perspective differs from Putnam's in two respects. First, I agree that something is wrong with the extrinsic/intrinsic dichotomy; I believe that the possibility that predicate be constructed either as an extrinsic or as an intrinsic one [6] is an essential feature of the natural language and that it grounds the idea that all predicates are *modal* in character, i.e. that to construct a predicate at a certain world it is necessary to take into account some other worlds [7]. This view is closely connected with the second issue I wish to point out. It concerns an answer to the question: *which is the relation the intension of a predicate bears to its extensions at different worlds?* I believe that this is a somehow more fundamental semantical assumption which lies behind the claim that by fixing truth-values for whole sentences one can specify the reference of individual terms.

Putnam's own interpretation of D1 looks to have the following structure: $C^\wedge(x)$ defines by: $C^\wedge(x)$ holds at w and $H(x)$ holds at w; or $C^\wedge(x)$ holds at w' and $C(x)$ holds at w' ... (which is equivalent to: at w, $C^\wedge(x)$ holds iff $H(x)$ holds; at w', $C^\wedge(x)$ holds iff $C(x)$ holds...). Think, e.g., of the phrase: at w, $C^\wedge(x)$ holds iff $H(x)$ holds. It is assumed that fixing the truth-value of $H(x)$ at w needs nothing but inspecting facts in w (that some cat is on some mat and that some cherry is on some tree). However, these facts are not modal, namely to find out it they hold or not at w it is not necessary to take into account other worlds in W except w (see [4]).

The set consisting of all x such that $H(x)$ holds at w is the extension of H at w. Analogously, define the extension of $C^\wedge$ at w. Note that to fix the extension of any predicate at each possible world one needs not assume any connexions among worlds. What about the intensions of these predicates? They are just derivative products consisting in putting together different extensions. But no constraint on this activity is required: it is for these reasons why predicates like cat^ or mat^ which have 'queer' intensions are on the same par with trivial predicates like cat or mat. Assume that x is in the extension of 'cat' at w; then we can state that *x is a cat*, but in a very narrow sense which does not involve at all that in this statement the intension of 'cat' is concerned. The case is the same to saying that a is in the set $\{a, b\}$ without assuming anything about the nature of a, b and $\{a, b\}$. That extensions (= sets of objects) might be grouped together as you like to yield intensions; that there is no connexion between cat-at-w and cat-at-w' except a verbal one — these amount in turn to the view that no interpretation is attached to any extensions. Cat-at-w is not the set of cats existing at w, but merely a set of arbitrarily collected objects [8].

The formal approach I wish to present in this paper aims to provide a reconstruction of the Fregean-type claim that *intension determines the*

[6] Note that this does not amount to the claim that cat is indiscernible from 'cat^'!.

[7] I use the term 'modal' essentially in the same sense as in my paper *A Modal Approach to Sneed's Theoretical Functions*. "Philosophia Naturalis", **21**, *2*, 1984, where I tried to argue that theoretical terms could be reconstructed as modal concepts. In this sense, I take the cat-on-mat paradox be indeed a proof by *reductio ad absurdum* that all predicates are theoretical, i.e. conceptually affected.

[8] Putnam does not reject this view; he rather disimisses a certain philosophical manner to make use of it, namely the perspective of metaphysical realism.

extension. Roughly speaking, the approach is this : one cannot divorce fixing the extension of a term at a world from fixing its intension. Being a cat at world w_1 is assumed in being a cat at world w_2. This view em bodies, I believe, three strategical advantages over the standard one. First, it preserves its results for it also takes intension be analysable with respect to extensions at every world. Second, it does not take intension be a derivative product ; and third, it does provide a much more general framework allowing for a critical comparison of both 'metaphysical realism' and 'internalism'.

Putnam interprets the definition of 'cat^', as follows : if w holds, then $C^{\wedge}(x)$ iff $H(x)$; if w' holds, then $C^{\wedge}(x)$ iff $C(x)$ .... The basic idea of the alternative interpretation I suggest is this. Let w_1 be in W ; then D1 comes to : for each w_1, if w_1 holds, then $C^{\wedge}(x)$ iff $H(x)$ holds at w, or $C(x)$ holds at w', or $H(x)$ holds at w'', or $C(x)$ holds at w'''. Let me write w_2A for : A holds at w_2 ; and write $w_1 \models$ as an indication that everything is going on at w_1. Then the definiton of 'cat' is :

(5) $w_1 \models C^{\wedge}(x)$ iff $w_1 \models wH(x) \vee w'V(x) \vee w''H(x) \vee w'''C(x)$ or, equivalently,

(6) $w_1 \models C^{\wedge}(x) \equiv wH(x) \vee w'C(x) \vee w''H(x) \vee w'''C(x)$

Analogously, predicate cat defines by (cf. D3) :

(7) $w_1^{\wedge} \models C(x) \equiv w^{\wedge}H^{\wedge}(x) \vee w'^{\wedge}C^{\wedge}(x) \vee w''{}^{\wedge}H^{\wedge}(x) \vee w'''^{\wedge}C^{\wedge}(x)$

I shall further assume that w and $w^{\wedge}$, w' and $w'^{\wedge}$ respectively are identical[9]. Thus, the definition of cat comes to :

(7′) $w_1 \models C(x) \equiv wH^{\wedge}(x) \vee w'C(x) \vee w''H^{\wedge}(x) \vee w'''C^{\wedge}(x)$

for every world w_1 in W. Analogously, define predicates cherry and cherry

(8) $w_1 \models H^{\wedge}(x) \equiv wC(x) \vee w'H(x) \vee w''C(x) \vee w'''H(x)$

(9) $w_1 \models H(x) \equiv wC^{\wedge}(x) \vee w'H^{\wedge}(x) \vee w''C^{\wedge}(x) \vee w'''H^{\wedge}(x)$

The first step of my argument is to reconstruct the cat-on-mat paradox within the frame of local semantics. To show that, it is necessary to prove (Putnam also does not escape this requirement) that if (6) and (8) hold, then, e.g., (7′) shall also be the case, i.e. it is predicate *cat* one yields with the help of predicates cat^ and cherry^ and not some other predicate cat^ ^which bears to cat^ exactly the same relation cat^ bears to cat. Let me substitute in (7′) $C^{\wedge}$ and $H^{\wedge}$ according to (6) and (8) ; then the result ought to be a logical truth :

(10) $w_1 \models C(x) \equiv w\,(wC(x) \vee w'H(x) \vee w''C(x) \vee w'''H(x)) \vee w'(wH(x) \vee w'C(x) \vee w''H(x) \vee w'''C(x)) \vee w''(wC(x) \vee w'H(x) \vee w''C(x) \vee w'''H(x)) \vee w'''(wH(x) \vee w'C(x) \vee w''H(x) \vee w'''C(x))$

and further, given the distributivity of world constants over propositional connectives [4] :

(10′) $w_1 \models C(x) \equiv wwC(x) \vee ww'H(x) \vee ww''C(x) \vee ww'''H(x) \vee w'wH(x) \vee w'w'C(x) \vee w'w''H(x) \vee w'w'''C(x) \vee w''wC(x) \vee w''w'H(x) \vee w''w''C(x) \vee w''w'''H(x) \vee w'''wH(x) \vee w'''w'C(x) \vee w'''w''H(x) \vee w'''w'''C(x)$.

[9] Putnam asserts that w_1 and $w_1^{\wedge}$ are the same world under a new description [3, p. 37]. But, as he also mentions, it is 'strangely enough'. I take w_1 and $w_1^{\wedge}$ be the same world for quite different reasons from Putnam's : according to *local semantics* [4] I make use of in this paper, worlds have a *transcendental* function in semantics ; they provide conditions of the possibility of all (modal or non-modal) facts at them.

A difficult issue concerns the logical status of an expression like: $ww''C(x)$ (its meaning is this: it holds at w that $C(x)$ is true at w''; or: that $C(x)$ is the case at w'' holds at w); it is indeed usual to query about the truth-value at world w'' of a sentencelike: 'Pussy is a cat', but it is 'strangely enough' to do the same with 'Pussy is a cat at w'. However, the case is much more familiar than it looke like. The logical form of the sentence: 'It snowed in Bucharest on March 10, 1985' is reminiscent of a very old logical puzzle, that is Aristotle's sea battle example and of course it makes sense to ask for the truth-value of this sentence at the world corresponding to, say, April 20, 1985. Another example is this: being left-handed is one of my contingent properties; but that I actually am left-handed must bet rue at any world in which I exist (in more general terms: let A be some property; then A-at-world-w (A_w) is a world-indexed property and if $A_w(a)$ holds, then it necessarily does). But here is another problem: some appropriate semantical conditions are needed to handle expressions like $w_1 \models ww'C(x)$. A natural *reduction* principle is the following:

(11) $w_1 \models w_2w_3A$ iff $w_1 \models w_3A$

Thus (with respect to w_1): that A is the case at w_3 is true at w_2 iff A is the case at w_3. This principle asserts that facts at w_3 are adequately reflected at w_2 [10]; world w_3 is adequately mirrored by w_2 – i.e. it looks from inside w_2 as it actually [11] is. By (11), expression (10′) reduces to:

(12) $w_1 \models C(x) \equiv w(C(x) \vee H(x)) \vee w'(C(x) \vee H(x)) \vee w''(C(x) \vee H(x)) \vee w'''(C(x) \vee H(x))$

If quantification over world-variables is allowed, one gets:
(12′) $w_1 \models C(x) \equiv (Ew_2)w_2(C(x) \vee H(x))$. Let H be exactly $-C$; then:
(12″) $w_1 \models C(x) \equiv (Ew_2)w_2\ (C(x) \vee - C(x))$, or, equivalently,
(12‴) $w_1 \models C(x)$. However, that some object is a cat at any world w_1 is not a logical truth. The moral is then that the cat-on-mat paradox is not derivable under the reduction principle (11), while, as Putnam claims, it could not be avoided by metaphysical realism.

III. **Metaphysical realism.** A more detailed analysis of the operation of substituting predicated $C^\wedge$ and $H^\wedge$ in (7′) to yield expression (9) seems to be required. Consider again expression (7′). By (8), there is an expression A which is equivalent under the context $w_1 \models$ to $H^\wedge(x)$, i.e. (13) $w_1 \models H^\wedge(x)$ iff $w_1 \models A$ holds. Now, when substituting A for $H^\wedge(x)$ in (7′), we are concerned, e.g., with a context (14) $w_1 \models w''H^\wedge(x)$. I maintain that some reduction principle (weaker than (11)) holds: then (14) gets equivalent to (14′) $w_2 \models H^\wedge(x)$. But in this case $H^\wedge(x)$ cannot be replaced by A in (14′) for $H^\wedge(x)$ and A are equivalent under the context $w_1 \models$, while the substitution were to be done under $w_2 \models$.

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[10] (11) is grounded by the following semantical hypothesis: sentence A is context-free, namely it does express at any world the same proposition (=its intension is not world-indexed). Of course, were (11) be rejected, a Strawsonian semantics would be required.

Note also that (11) is a realist hypothesis: but it is *extremely naive*. Indeed, let w_1 stand for some conceptual schema and $\bar{w}_3$ for 'the true description of the WORLD'; then (11) is plainly false. 'Metaphysical realism is' a much more sophisticated version of a realist perspective!

[11] 'Actual' is obviously understood with respect to w_1.

The solution to the puzzle I suggest is this. The paradox involves a certain sort of non-adequate reflection relation between worlds : world w_1 looks from the standpoint of world w_2 like w_3 ; or : the reflection of world w_1 in world w_2 is a world which actually (= from the standpoint of the actual world w_4) is w_3 [12]. A very simple model for *reflection relations* could be designed in the following way. Remember that to each world w_1 was assigned a pair (i_1, j_1) of integers, with $i_1, j_1 = 1, -1$. Now I define relation $R(w_1, w_2, w_3)$ (the reflection of w_2 at w_1 is world w_3) by : $R(w_1, w_2, w_3)$ holds iff $w_3 = w_1 \cdot w_2$, where '.' is an operation on W the definition of which runs as follows : if $w_1 \leftrightarrow (i_1, j_1)$, $w_2 \leftrightarrow (i_2, j_2)$, then $w_3 \leftrightarrow (i_1 \cdot i_2, j_1 \cdot j_2)$. Further, each context $w_1 w_2 A$ may be substituted by $w_3 A$, if $R(w_1, w_2, w_3)$ holds [13].

All the results I am going to present below fall under the context $w \models$; this point, as I shall argue below, is essential in the reconstruction of 'metaphysical realism'.

Expression (10′) is reducible (by use of relation R) to :

(15) $w \models C(x) \equiv wC(x) \vee w'H(x) \vee w''C(x) \vee w''' H(x)$

or, equivalently, (16) $w \models C(x) \equiv H^{\wedge}(x)$. Analogously, it is not difficult to prove : (17) $w \models C^{\wedge}(x) \equiv H(x)$. Using again the reflection relation R and D2, one immediatly obtains from (17) :

(17′) $w \models C^{\wedge}(x) = w'w'C^{\wedge}(x) \vee w' wH^{\wedge}(x) \vee w'w'^{\wedge} C^{\wedge}(x) \vee w' w''H^{\wedge}(x)$

(17″) $w \models C^{\wedge}(x) \equiv w'(w'C^{\wedge}(x) \vee wH^{\wedge}(x) \vee w'''C^{\wedge}(x) \vee w''H^{\wedge}(x))$

(17‴) $w \models C^{\wedge}(x) \equiv w'C(x)$

(17)states that in the actual world w 'cat^' refers to cherries ; but by (17‴), 'cat^', as it is used is under the context $w \models$, refers in world w' to cats.

The full reconstruction of D1 under the context $w \models$ also needs the proof — by use of the same devices — of :

(17⁗)$w \models C^{\wedge}(\mathrm{x}) \equiv w''H(x)$; (17′′′′′) $w \models C^{\wedge}(x) \equiv w'''C(x)$

It is important to note that (17‴) entails the expression :

(18) $w \models w'w'(C^{\wedge}(x) \equiv w'C(x))$, which is equivalent to (18′) $w \models w'(w'C^{\wedge}(x) \equiv C(x))$, but neither (19) $w \models w'(C^{\wedge}(x) \equiv C(x))$, not

(19′) $w' \models C^{\wedge}(x) \equiv C(x)$ are provable.

It is possible to discuss now the issue of 'metaphysical realism'. To quote Putnam's own words ; 'in this perspective, the world consists of some fixed totality of mind-independent objects. There is exactly one true and complete description of 'the way the world is' " [3, p. 49]. The reference of a term of a language is some piece of the WORLD (or, a *kind* of piece, if the term is a general term) [1, p. 124]. Putnam is right, I believe, in claiming that this realism [14] favours just one point of view :

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[12] A much more mundane example is this : the projection of a circle on a plane is either adequate, or not (it might be, e.g., an ellipse).

[13] It is not difficult to show that :

$w.w = w$	$w'w = w'$	$w''.w = w''$	$w'''.w = w'''$
$w.w' = w'$	$w'.w' = w$	$w''.w' = w'''$	$w'''.w' = w''$
$w.w'' = w''$	$w'.w'' = w'''$	$w''.w'' = w$	$w'''.w'' = w'$
$w.w''' = w'''$	$w'.w''' = w''$	$w''.w''' = w'$	$w'''.w''' = w$

It is worth noting that the reflection of a world w_1 at itself is the *actual* world w ; were we inhabitants of some other world, then it would have been for us the actual world ! ('Actual' is — under a context $w_2 \models$ — an indexical term). This is the basic intuition which lies behind the definition of relation R.

[14] I think that all sorts of realism share this feature : the point is, however, to tell what does 'point of view' mean. Local realism I sketch in the next section radically changes the meaning of 'point of view'.

A difficult issue concerns the logical status of an expression like: $ww''C(x)$ (its meaning is this: it holds at w that $C(x)$ is true at w''; or: that $C(x)$ is the case at w'' holds at w); it is indeed usual to query about the truth-value at world w'' of a sentencelike: 'Pussy is a cat', but it is 'strangely enough' to do the same with 'Pussy is a cat at w'. However, the case is much more familiar than it looke like. The logical form of the sentence: 'It snowed in Bucharest on March 10, 1985' is reminiscent of a very old logical puzzle, that is Aristotle's sea battle example and of course it makes sense to ask for the truth-value of this sentence at the world corresponding to, say, April 20, 1985. Another example is this: being left-handed is one of my contingent properties; but that I actually am left-handed must bet rue at any world in which I exist (in more general terms: let A be some property; then A-at-world-w (A_w) is a world-indexed property and if $A_w(a)$ holds, then it necessarily does). But here is another problem: some appropriate semantical conditions are needed to handle expressions like $w_1 \models ww'C(x)$. A natural *reduction* principle is the following:

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Thus (with respect to w_1): that A is the case at w_3 is true at w_2 iff A is the case at w_3. This principle asserts that facts at w_3 are adequately reflected at w_2 [10]; world w_3 is adequately mirrored by w_2 — i.e. it looks from inside w_2 as it actually [11] is. By (11), expression (10′) reduces to:

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[11] 'Actual' is obviously understood with respect to w_1.

there is one 'true' description of 'the way the world is'. *All* contexts are reducible to just one : realism is an externalist perspective just in this sense (its favourite point of view is God's Eye point of view [3, p. 49]).

Within the framework of local semantics, context $w \models$ was used above as an absolute view. First, all contexts have been represented under $w \models$. Indeed, a realist could not take (19′) be a meaningful expression; he rather thinks of it as of an abbreviation of the meaningful expression (19). Second, something is held to be the case under $w \models$ if it can be regarded as a part of 'the way the world is'.

(Note that this result is due not to the fact that w happens to describe the actual state of affairs, but to the logical properties of w which are entailed by the definition of the reflection relation R).

However, metaphysical realism, as proved above, leads to the cat-on-mat paradox and makes all attempts to divorce extrinsec from extrinsec properties fail. Putnam champions an *internalist* perspective :

'Objects do not exist independently of conceptual schemes. *We* cut up the world into objects when we introduce one or other schema of description. Since the objects *and* the signs are alike *internal* to the schema of description, it is possible to say what matches what' [3, p. 52].

Some important features of internalism are captured, I believe, in the following interpretation. Suppose the very language in which the cat-on-mat paradox is stated is skolemized. Then one could find an interpretation of that language so that 'cat^', would refer to cherries not in the actual world, but in some other world. Consequently, it is not possible to prove that 'cat^', and 'cat' have different extensions *exactly* in the actual world; rather the argument shows that in some world w_1 'cat^' and 'cat' have different extensions. This argument — which could primarily be directed against Putnam — shows something very important yet: that an absolute context, if possible at all, is just a *regulative ideal* [15]. The point is then that there is no reasonable ground to assume that each context $w_1 \models$ is reducible to $w \models$. Moreover, there is no proof that $w \models$ is exactly the context that we intend it to be. Perhaps some $w_1 \models$ contexts could be regarded as semantical models of our conceptual schemes. But in this case the cat-on-mat paradox dissolves : for though $w \models C^{\wedge}(x) \equiv H(x)$ holds, neither $w' \models C^{\wedge}(x) \equiv H(x)$, nor $w' \models C^{\wedge}(x)$ are provable (if w' is a model of someone's conceptual schema). All these show that Putnam must be (in a certain sense) right.

IV. **Local realism.** It is not the aim of this paper to present at length an alternative to Putnam's internal realism. However, let me try to sketch the main lines of a philosophical perspective I call *local realism.* It differs both from metaphysical realism and also from internalism in two respects. First, it rejects the semantical hypothesis that *facts* are *semantical invariants*. This hypothesis states that facts are world-independent entities : worlds are maximal aggregates of such facts and two worlds are different iff there is some fact which is the case at the former but it is not the case at the latter. Second, it rejects the view that world-variables and world-constants are superrigid, i.e. that in $w' \models w''A$ and in $w \models w''B$, 'w''' refers to one and the same world.

[15] Truth is an idealization of rational acceptability [3, p. 55].

Assume, e.g., that: (20) $w \models H(x)$. Local realism agrees with the idea that a fact w_2A is in the context $w_1 \models w_2A$ the representation (or: the reflection) at w_1 of some fact $w_3 \models A$. Let us try to represent the fact $w \models H(x)$ at the world w' (Note that on the present view both 'A' and '$w \models A$' refer to facts ! $w \models A$ is a *modal* fact. See (4) for a more detailed account of this issue). We have:

(21) $w' \models w'(wH(x))$ and further: (22) $w' \models w'H(x)$; and also:

(23) $w' \models w'(wC^{\wedge}(x) \vee w'H^{\wedge}(x) \vee w''C^{\wedge}(x) \vee w''' \ H^{\wedge}(x))$

(23') $w' \models w'C^{\wedge}(x) \vee wH^{\wedge}(x) \vee w'''C^{\wedge}(x) \vee w'' \ H^{\wedge}(x)$

(23'') $w' \models C(x)$

The fact at w that x is a cherry is at w' the fact that x is a cat. Now if we try to represent (24) $w \models H^{\wedge}(x) = wC(x) \vee w' \ H(x) \vee w''C(x) \vee w'''H(x)$ at w', we get:

(24') $w' \models C^{\wedge}(x) \equiv wH(x) \vee w'C(x) \vee w''H(x) \vee w'''C(x)$ [16]

Now compare (24') with

(6') $w \models C^{\wedge}(x) \equiv wH(x) \vee w'C(x) \vee w''H(x) \vee w'''C(x)$

The definition of the predicate 'cat' has the same form at every possible world. This is ***the relativity principle in semantics:*** though facts are world-dependent, statements of how a predicate gains its intension (and this is the case with the definition of 'cat^') are ***semantical invariants***[17]. It is this sense in which I hold that local realism does favour just only one point of view[18].

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[16] Observe, however, that in (24') 'w' does not refer to the *real* (viz.: from God's Eye point of view) world w, but to its reflection in w', namely the world w'.

[17] The same status have all the expressions which, as shown above, could be used by Putnam to dissolve the cat-on-mat paradox. Therefore, local realism also disregards the cat-on-mat paradox.

[18] I stated in section II above that the basic idea of the present approach is that when one tries to determine at world w_1 the predicate 'cat' he does not pick up a set of arbitrarily collected objects: rather he is concerned with a concept he takes to be satisfied at w_1 by certain objects; and he takes this concept to have certain extensions at different worlds.

However, the set of worlds one needs to take into account varies with the world-context itself. When I say: x is a cat-at-w_1, I am concerned with the extension of 'cat' to some other worlds (I hope the reader agrees with neglecting here all discussions about natural kinds). But local realism embodies the thesis that those worlds are worlds-viewed-from-the-standpoint-of-w_1. Or, to put it in another way: the concept one is concerned with at w_1 to fix the reference of 'cat' at w_1 is not necessarily the same with the concept one is concerned with at w_2.

But here is another problem: how is there possible to keep reference unaffected? My solution is this: concepts do always fall under some contexts $w_1 \models$; but it is always possible — according to the local realism — to take their definition under the context $w \models$ work under $w_1 \models$. This does not amount in effect to taking each context $w_1 \models$ be a subcontext of $w \models$, i. e. that $w_1 \models A$ be in turn analysable as $w \models w_1A$, — which is the position of metaphysical realism. Local realism states that the reference, as fixed at $w \models$, is preserved at, e. g., $w' \models$. The reference of 'cat' is the same at $w \models$ and also at $w' \models$, though the concept employed in the former context to fix its reference is different from the one employed in the latter (see again as an illustration of this point the relation expression (20) bears to (23')): roughly speaking, this is the deep meaning I wish to attach to the central thesis of the causal theory of referring — that reference, once fixed by some device, is trans-contextual.

The definition of 'cat' is a semantical invariant: therefore it is possible to say what matches *what.*

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